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LABOR PRODUCTIVITY IN THE SELECTED SEE COUNTRIES: TRENDS AND DETERMINANTS

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This study examines labor productivity in the Open Balkan initiative countries (Albania, Serbia, and North Macedonia) and Southeastern Europe's latest EU entrants (Bulgaria, Romania, and Croatia). In the study, macroeconomic and institutional factors, including the Gross National Income (GNI) *per capita*, the unemployment rate, the statutory minimum wage, and the labor freedom index are analyzed in relation to labor productivity. The study used econometric methods to identify the labor productivity determinants and discern the labor market differences between the two groups of countries. The key findings emphasize the pivotal role of economic development in Southeastern Europe, especially among the last EU entrants, fostering additional increases in labor productivity. The study reveals the significant influence of the labor freedom index on productivity, with nuanced implications for both groups of countries. Additionally, it highlights the tangible impact of the statutory minimum wage policies on labor productivity in the Open Balkan initiative countries, indicating potential shifts in the wage structures and broader economic landscapes. The interplay of variations in the unemployment rate emerges as a substantial factor shaping efficiency and overall productivity in the labor market across both groups. These findings provide valuable insights into the labor market complexities faced by the Open Balkan countries, underscoring the need to bridge the gaps for economic development catch-up.

Keywords: labor productivity, unemployment rate, Open Balkan initiative, Southeastern Europe

JEL Classification: J21, J31, J88

INTRODUCTION

Countries' material well-being and development are still largely influenced by the productivity levels and growth. A sustainable increase in labor productivity is necessary to improve the performance of national economies and international competitiveness (Krugman, 1994; Heil, 2018). In the context of advanced economies, preserving the societal standard of living amidst the backdrop of population aging is paramount. However, notwithstanding its pivotal role, there is a prevailing consensus that advanced economies, exemplified by the USA and the European Union, have witnessed a conspicuous deterioration in labor productivity growth rates since the onset of the Great Recession in 2007 (Mishel, 2012; Bivens

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& Mishel, 2015). Nevertheless, the period following the global economic crisis witnessed a sustained economic growth trend in both developed and developing countries, especially after 2015. However, the unexpected onset of the COVID-19 pandemic led to a global economic crisis, which severely destabilized the labor markets and disrupted their previous equilibrium. The pandemic compelled a significant number of workers to face the risk of a temporary or permanent job loss, placing workers with limited skills, low productivity, and qualifications at a higher risk of poverty. The deterioration of the labor market was exacerbated by disruptions in supply chains, a significant increase in energy prices, and the geopolitical tensions arising from the conflict between Ukraine and Russia. Such exogenous shocks caused a deepening of macroeconomic instability, a significant increase in inflation, especially in food prices, as well as insufficient GDP growth rates. The negative repercussions are especially worrying in the countries of Southern and Eastern Europe, which are characterized by extremely low labor productivity and permanently high unemployment rates.

For decades, the countries of Southern and Eastern Europe have been leading the process towards integration and full membership in the EU. Some of the countries such as Bulgaria, Romania, and Croatia have been members of the EU for more than 10 years, while countries such as Albania, Serbia, and North Macedonia, although they have the candidate status, are still "far" from EU membership. In the case of the Central European countries, EU integration influenced changes in the economic structure and productivity through the implementation of the four freedoms of the European Single Market, specifically the free movement of goods, the free movement of capital, the free movement of persons, and the free movement of services (Dobrzański & Grabowski, 2019). With a respect to increasing cooperation and liberalizing economic flows between the EU candidate Balkan countries (Albania, Serbia, and North Macedonia), the "Open Balkan" regional initiative has been created. The basic aim of the initiative is to meet the high challenges facing these countries and improve their competitive standing on their way to full integration in the EU. Also, the regional economic cooperation called the "Open Balkan", which is based on the free movement of people, capital and goods and services, aims to increase regional cooperation and improve the competitiveness of these countries in order to reduce the gap with the rest of the EU countries.

Since the EU countries from Southern and Eastern Europe differ from the EU candidate countries in terms of economic development, it is important to note that, despite a reduction in differences in economic development over the past decade, the gap still persists. The countries of the European Union (EU) in Southeastern Europe had experienced robust rates of labor productivity in the pre-COVID-19 era, fostering sustainable economic growth. Nevertheless, certain Southeastern European countries, notably Bulgaria, Romania, and Croatia, significantly lag behind the EU average in terms of economic performance, particularly concerning the level of labor productivity. As per the Global Competitiveness Index (GCI), Bulgaria ranks 49th, Romania is 68th, Croatia is positioned as 74th, Albania stands at 75th, and Serbia ranks 78th. According to the GCI, the gaps between these two groups of countries are not particularly big. The level of economic development and labor market performance does not significantly differ between them, either (World Economic Forum, 2017).

This analysis aims to explore the trends in labor productivity in the countries participating in the "Open Balkan" initiative (Albania, Serbia, and North Macedonia), and in the Southern and Eastern European nations that were former EU entrants (namely Bulgaria, Romania, and Croatia). Additionally, the study will assess the influence of distinct macroeconomic variables on labor productivity in both groups of countries. The study has the goal to analyze the influence of specific macroeconomic and institutional determinants (i.e. the statutory minimum wage, the labor freedom index, unemployment, and Gross National Income *per capita*) on labor productivity. Additionally, the study aims to draw comparisons between the countries that are the European Union (EU) members and those participating in the "Open Balkan" initiative.

The examination of labor productivity performance, one of the key indicators of labor market efficiency, necessitates the inclusion of the labor institutional framework. Institutional indicators such as the labor freedom index and the statutory minimum wage are incorporated in this analysis. The institutional framework, the quality of institutions and their impact on economic performance are in the focus of the empirical and theoretical literature (Nissan & Niroomand, 2008). Some authors underscore the importance and quality of institutions in influencing a country's economic performance, particularly in the creation of human and physical capital, as well as technological progress. This connection is also evident in its direct impact on labor productivity (Acemoglu & Robinson, 2008; Bjørnskov & Foss, 2010). Some economists also stress the importance of high-quality labor market institutions in enhancing productivity and fostering sustainable rates of economic growth (Acemoglu, Johnson & Robinson 2004).

In the context of institutional frameworks, the inclusion of the statutory minimum wage as a determinant of labor productivity is especially relevant in the Southern and Eastern European countries. This significance arises from a substantial portion of workers categorized as minimum wage recipients and a considerable proportion of the statutory minimum wage in the average wage (World Bank, 2019). According to the economists supporting the establishment and raising of the minimum wage, this action is expected to augment income for low-skilled workers. Moreover, it is anticipated to enhance labor productivity, especially among the low-skilled workers who will transfer their skills to more productive sectors of the economy (Sabia, 2015). In both theoretical and empirical literature, the adverse impacts of the statutory minimum wage, particularly on low-skilled workers, individuals with limited work experience, and young workers, have been discussed (Neumark, 2018). The raise in the statutory minimum wage leads to the exclusion of certain workers from the labor market. In other words, they encounter difficulties securing employment due to the minimum wage surpassing the equilibrium level. This situation diminishes the potential for utilizing productive employment opportunities (Giuliano, 2013). Hence, the analysis will incorporate the labor freedom index and the statutory minimum wage as the institutional determinants influencing labor productivity. These indicators will serve as the essential variables in assessing the multifaceted dynamics that contribute to variations in productivity levels across the selected countries.

The incorporation of the macroeconomic variables, such as the unemployment rate and the level of economic development, is crucial as they reflect the characteristics of both the labor market and the economy as a whole. As human capital and the level of technology play a major role in labor productivity, it follows that higher levels of labor productivity correlate with higher levels of accumulated human capital and technology. Thus, higher economic development is associated with higher levels of labor productivity (Syverson, 2011). Hence, the inclusion of the GNI *per capita* is considered as one of the determinants that have a significant impact on labor productivity. In the period from 2014 to 2019, following the mitigation of the negative effects of the financial crisis of 2008-2009, unemployment has exhibited a declining trend in nearly all European countries. Nonetheless, despite this decreasing trend, unemployment persists at notably high levels in certain countries. The countries such as Albania, North Macedonia, and Serbia saw double-digit unemployment rates in 2022 (World Bank, 2022). The additional limiting factors for raising labor productivity include the participation of the long-term unemployed (the people who have not worked for more than a year) in total unemployment (Duell, Thurau & Vetter, 2016). Due to the nature of unemployment, the negative effects on the overall performance of the economy become apparent, particularly so being attributed to the erosion of the skills leading to the destruction of human capital and the challenges associated with reintegration into the labor force. Given the potential negative impact that unemployment may exert on the long-term productivity growth rates of the Southern and Eastern European countries, it seems appropriate to include unemployment as a determinant of labor productivity (Bräuninger & Pannenberg, 2000). The inclusion of the unemployment rate as the determinant influencing the capacity of labor markets to generate productive

employment is considered particularly relevant in the Southeastern European countries characterized by notable unemployment rates. Therefore, high and noticeable unemployment rates have substantial adverse consequences for worker performance (Weisskopf, 1987)

This paper contributes to the empirical literature on the macroeconomic and institutional determinants of labor productivity. The primary contribution of the present study lies in its comparative analysis between the countries participating in the "Open Balkan" initiative (Albania, Serbia, and North Macedonia) and the most recent EU entrants (Bulgaria, Croatia, and Romania), examining the trends in labor productivity in these two groups of countries. The study also analyzes the GNI *per capita*, the statutory minimum wage, the unemployment rate, and the labor freedom index as the determinants of labor productivity in both sets of countries. This research stands out as one of the initial studies to scrutinize labor market performance in the countries of the "Open Balkan" initiative, using a diverse set of macroeconomic and institutional variables and offering comparisons with other Southeastern EU countries.

This paper is structured as follows: after the introduction, the research methodology is presented. Furthermore, a thorough analysis of the pertinent empirical and theoretical literature related to the labor market is provided. The subsequent section discusses the trends of the fundamental labor market indicators. The results of the econometric analysis are presented and elaborated in the subsequent section. The concluding remarks are provided at the end of the paper.

TRENDS ON THE SOUTHEASTERN EUROPEAN LABOR MARKETS

The structural reforms and exogenous shocks that impacted the European economies also left an imprint on developing countries. Consequently, the labor markets in Southern and Eastern European countries have undergone notable changes in both the structure and performance. In recent years, these nations have made substantial progress in reducing unemployment, increasing employment, and raising the activity rate. Despite the positive trends in the specific segments of the labor market, Southern and Eastern European countries need to persist in their efforts to narrow gaps with comparator nations and anticipate future prospects for their respective labor markets.

Coupled with stagnant or decreasing productivity, unchecked wage pressure is undermining the competitiveness of the Southern and Eastern European countries. The average wage has risen in most of these nations, primarily due to increases in the statutory minimum wage affecting wages in the public sector. Recent years have seen an above-average rise in the statutory minimum wage across the Southern and Eastern European countries. For instance, in 2019, the minimum wage as a percentage of the average wage in the countries of the "Open Balkan" initiative was approximately 50% (World Bank, 2019). Notably, Hungary experienced a significant increase in the statutory minimum wage from EUR 467 to EUR 542, representing a 19.5% rise. Similar increases were observed in Bulgaria, Croatia, and Romania, with statutory minimum wages rising by more than 10% (Eurofound, 2023). Despite nominal increases in minimum wages across Europe, the real wage value growth remains uncertain when accounting for changes in prices. Studies indicate that, due to inflation, these increases did not lead to real gains in the two-thirds of the EU member states (Eurofound, 2023). Table 1 illustrates the statutory minimum wage values from 2013 to 2021 in USD. Albania had the lowest minimum wage at USD 239 in 2020, whereas Serbia had the highest among the non-EU countries participating in the "Open Balkan" initiative, at USD 393 per month. In 2020 North Macedonia's minimum wage of USD 390 exceeded Albania's significantly, even surpassing the Bulgarian one. This discrepancy may reflect differing economic conditions and the labor market dynamics between the countries. Comparatively, Bulgaria had the lowest minimum wage among the EU member states, amounting to USD 355 in 2020. Croatia and Romania, both EU members, had the minimum wages USD 614 and USD 525, respectively, in 2020 (Table 1).

Table 1 The selected countries' statutory minimum wage expressed in USD in the period 2013-2020

Year	Albania	North Macedonia	Serbia	Croatia	Bulgaria	Romania
2013	208.2	264.42	316.77	523.2	210.37	240.39
2015	174.66	251.83	261.03	441.73	215.37	262.13
2016	177.22	261.31	255.03	458.42	237.55	307.94
2017	201.51	313.36	283.84	494.58	265.06	357.8
2018	222.24	333.35	332.97	547.82	307.78	482.04
2019	236.68	382.13	345.51	566.25	320.54	490.81
2020	239.3	389.83	392.6	614.22	355.41	525.45

Source: The ILO database and the national statistics offices.

Despite the period of low inflation, the overall price level has become more prominent since 2021, largely due to the impact of the COVID-19 pandemic on national economies. Disrupted supply chains, labor market destabilization, and job closures, compounded by the conflict in Ukraine and escalating energy prices, have led to increased inflation across nearly all European economies. Therefore, Table 1 presents the nominal values, specifically the minimum wage values established by legal decisions. To analyze changes in the living standard and the purchasing power of the workers receiving the minimum wage, it is necessary to present the minimum wage levels adjusted for purchasing power. Figure 1 displays the statutory minimum wages expressed in USD, adjusted for the purchasing power parity from 2013 to 2020. During this period, the Republic of North Macedonia's statutory minimum wage adjusted for the purchasing power parity increased from USD 522 to USD 928. Compared to the other countries, North Macedonia's real minimum wage is higher than that of Albania's, Bulgaria's, and Serbia's, with only Romania and Croatia having a higher level of the real minimum wage. In 2020, Albania had the lowest statutory minimum wage USD 499 (Figure 1).

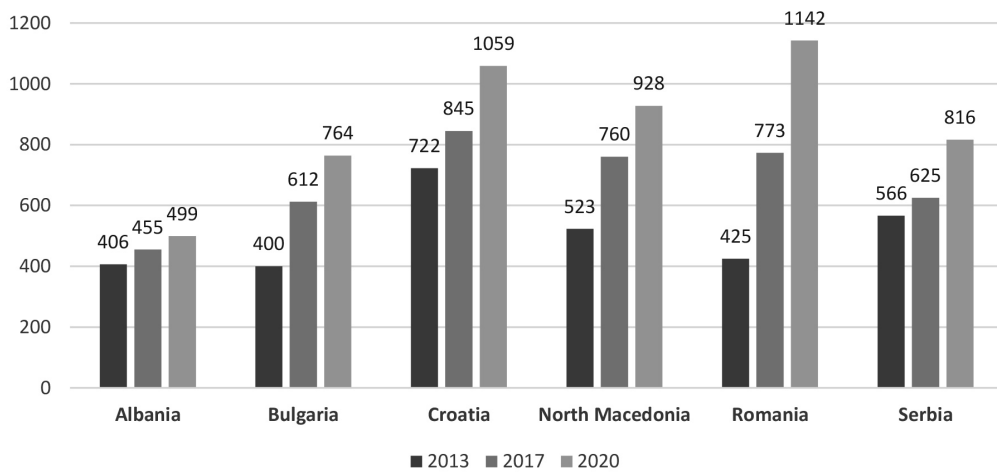

Figure 1 The statutory minimum wage expressed in USD (Purchasing Power Parity (PPP))

Source: International Labour Organization (2023) and the national statistics offices.

The rise in the statutory minimum wage significantly impacts labor costs, influencing wage distribution and employment dynamics. Studies generally indicate a compressive wage distribution with minimal positive correlation between the minimum wage and employment. The research done in the minimum wage effects on gross national income, unemployment, and labor productivity provides comprehensive insights into the trends of these variables. Figure 2 illustrates the labor productivity trends in USD adjusted for the purchasing power parity from 2013 to 2021, thus facilitating country comparisons and conclusive inferences. For the "Open Balkan" countries (Albania, North Macedonia, Serbia), labor productivity stagnated from 2014 to 2019, but increased in 2020, despite the pandemic's adverse effects. In Southeastern EU countries (Bulgaria, Romania, Croatia), labor productivity had demonstrated an increase until 2020, with significant declines in Croatia and Romania attributed to the pandemic. However, Romania experienced a notable rebound in labor productivity in 2021. In terms of the purchasing power parity, Bulgaria's labor productivity remained consistently low compared to Romania's and Croatia's.

The GNI *per capita* data adjusted for the purchasing power parity spanning from 2013 to 2021 is visually presented in Figure 3, thus facilitating comparative analysis among the countries participating in the

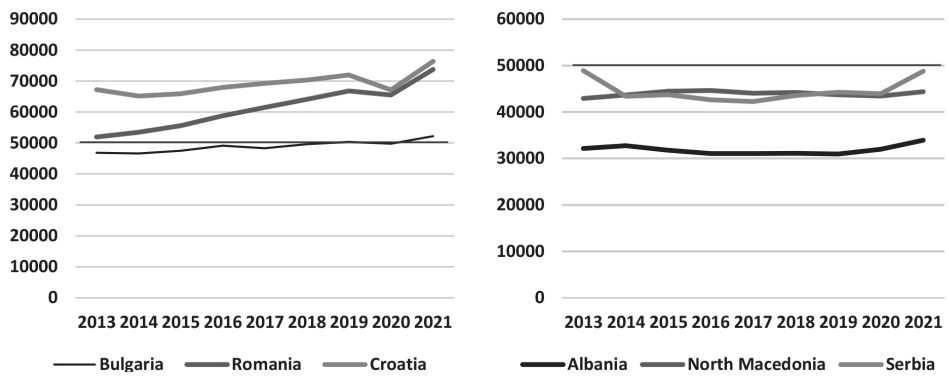

Figure 2 Labor productivity, in USD (Purchasing Power Parity (PPP))

Source: International Labour Organization (2023) and the national statistics offices.

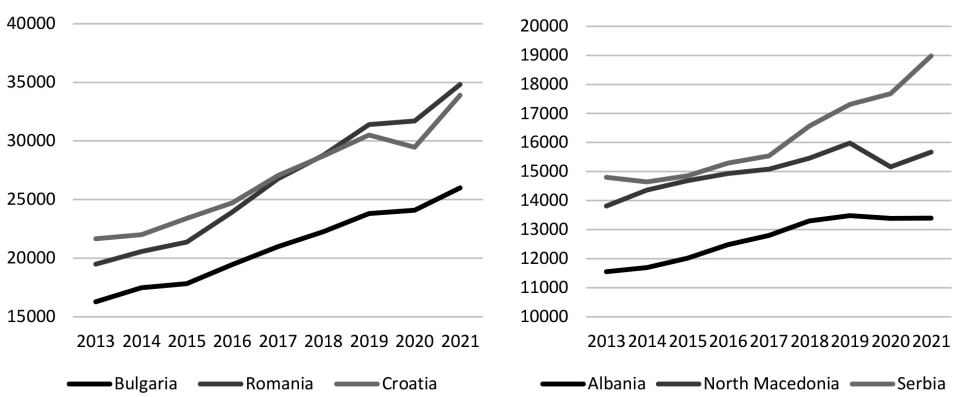

Figure 3 Gross national income *per capita* in USD (Purchasing Power Parity (PPP))

Source: International Labour Organization (2023) and the national statistics offices.

"Open Balkan" initiative (Albania, Serbia, and North Macedonia) and the most recent Southeastern EU entrants (Bulgaria, Romania, and Croatia). The data elucidates a positive economic trend overall. Romania consistently leads in the GNI *per capita*, simultaneously showcasing substantial growth over the years. Notable increases are observed in Serbia and North Macedonia, particularly in 2021. In stark contrast, Albania consistently maintains the lowest GNI *per capita* within the examined timeframe. These disparities accentuate the diverse economic conditions among the nations. The influence of the external factors, notably the COVID-19 pandemic, is discernible, and intriguingly, certain countries managed to sustain or augment their GNI *per capita* despite adverse economic circumstances.

Before the crisis, most European countries experienced a declining trend in unemployment rates, including the Western Balkan nations, despite the relatively high unemployment percentages. Albania, North Macedonia, and Serbia all had unemployment rates exceeding 10%, with North Macedonia experiencing a 13-percentage-point decrease from 2013 to 2021, although the rate slightly increased in 2021. Serbia generally saw a decreasing unemployment trend, reaching its lowest rate of 9% in 2020, but increasing to 10.06% in 2021. Albania's unemployment rate remained around 11% from 2018 to 2021. Furthermore, the COVID-19 pandemic moderately affected the labor market in the Western Balkan countries, mitigated by economic policymakers' interventions through various aid packages. Conversely, the EU member states experienced more pronounced pandemic effects on the labor market. Bulgaria, Romania, and Croatia recorded increased unemployment rates since 2019. Bulgaria's rate decreased from 12.94% in 2013 to a low of 4.23% in 2019 but rose to 5.6% in 2021. Romania's rate ranged from 3.9% to 7.1%, with a low of 3.9% in 2019 and 5.6% in 2021. Significantly higher than that of its counterparts, Croatia's unemployment rate decreased from 17.3% in 2013 to 6.6% in 2019 but rose to 7.6% in 2021. The impact the pandemic had on the labor market, especially in the sectors such as tourism and retail, led to increased unemployment and reduced working hours in many countries. North Macedonia experienced a 10% decrease in working hours in 2020 compared to 2019, with a further 3.35% decrease in 2021. Serbia's working hours decreased by 0.61% in 2020 but increased thereafter. Romania saw a substantial decrease of 5.87% in 2020 and a further 6.05% decrease in 2021. This trend was observed globally, with an average of 8.8% of working hours lost in 2020, particularly impacting low-to-middle-income countries.

The Labor Freedom Index quantifies the various components of the legal and regulatory legislation

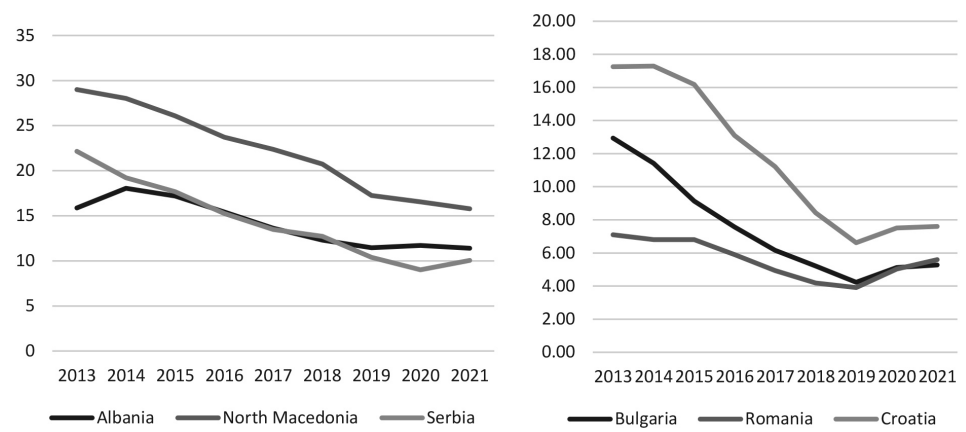

Figure 4 Unemployment in % (2013-2021)

Source: International Labour Organization (2023) and the national statistics offices.

related to the labor market in a country. Hence, this index also includes the regulations relating to minimum wages, labor legislation, i.e. the laws that determine workers' rights, namely the regulation of dismissals, determining the amount and period in which the employee should receive severance pay, as well as the rest value-expressed restrictions on employment, as well as working hours. Hence, the Labor Freedom Index is composed of the following six components: the minimum to the average added value per worker ratio; the legal framework and legislation that represent rigidities in hiring workers; rigidities in working hours; difficulties in dismissing workers due to redundancy; the legally regulated notice period; the mandatory severance pay. The Labor Freedom Index ranges from 0 to 100, implying a proportional ratio of the value to the workers' freedoms and the labor legislation flexibility. On the example of North Macedonia, a decreasing trend in the workers' freedoms index can be seen. Its highest value of 78.8 index points in 2014 decreased to 66.7 in 2017. After the previous downward trend in 2021, the workers' freedoms index in North Macedonia recorded the lowest value of 65.2 index points. Serbia's workers'

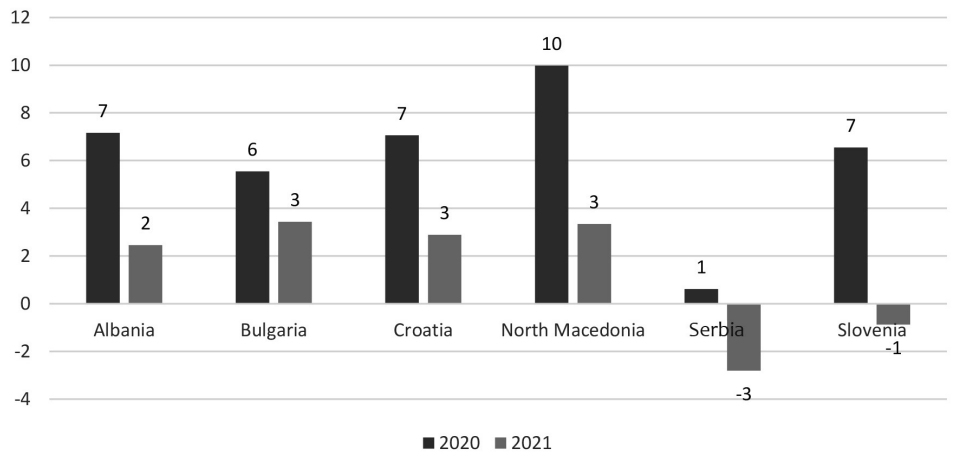

Figure 5 The loss of working hours as a result of the COVID-19 pandemic (%)

Source: International Labour Organization (2023) and the national statistics offices.

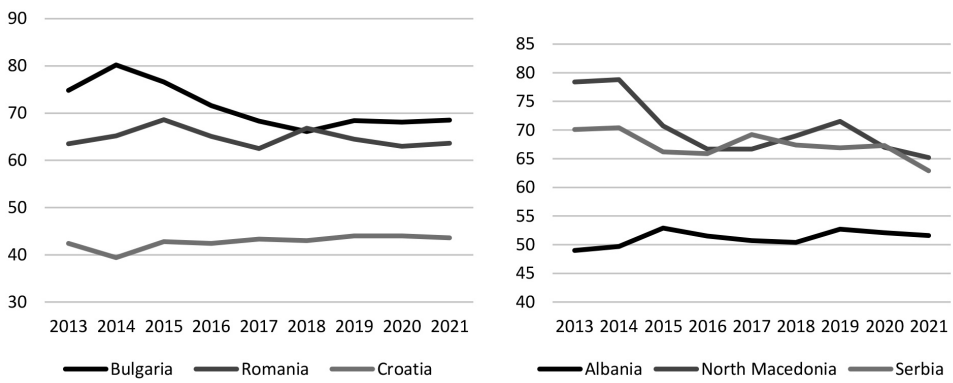

Figure 6 The labor freedom Index (2013-2021)

Source: The Heritage Foundation (2022).

freedoms index movement trend follows a similar trajectory as that in North Macedonia. However, workers' freedoms in Albania hover around 50 index points, indicating the low levels of flexibility in labor laws. The value of the workers' freedoms index for the example of the second group of countries shows that the lowest value is noticeable in the case of Croatia, ranging from 39.4 index points to 44 index points.

Furthermore, this index records a value of 68.5 index points in the case of Bulgaria and 63.6 index points in the case of Romania. The Labor Freedom Index movement trend shows that labor legislation rigidity, insufficient flexibility, and barriers to entrance onto and exit from the labor market is most pronounced in Albania and Croatia. On the other hand, the rest of the countries record the workers' freedoms index higher than 60 index points, which implies that the labor market flexibility is at a higher level compared to the world average.

LITERATURE REVIEW

The decoupling phenomenon between labor productivity and workers' compensation has been studied extensively since the mid-1970s, with early explorations by J. Alterman (1971) and G. Sleight Lynn and W. Gruebele James (1973) highlighting this trend. This period marked a significant divergence between labor productivity and workers' compensation, prompting economists to delve into the underlying causes and consequences. J. A. Mincer's analysis in 1974 emphasized the causal relationship between human capital growth, labor productivity, and wages, indicating that increased human capital led to higher wages. Research studies leading up to the Great Recession in 2008, such as F. Roth and A. E. Thum (2013) and A. M. Stansbury and L. Summers (2018), suggest a weakening link between labor productivity and wages. For instance, P. Oreopoulos (2007) found that education investments in Greece did not increase labor productivity, simultaneously leading to delays in wage growth. J. Konings and S. Vanormelingen (2015) studied the correlation between labor productivity and wage disparities at the individual company level, revealing a positive relationship. D. Nikulin (2015) analyzed the wage, labor productivity, and unemployment trends in the new EU member states, indicating significant differences among the countries. Additionally, empirical studies have confirmed a positive relationship between minimum wage increases and labor productivity, as shown by M. F. Owens and J. H. Kagel (2010). However, conflicting conclusions were drawn by N. T. Dickerson (2009) and R. Riley and C. R. Bondibene (2017), suggesting no significant relationship between minimum wage increases and labor investment. Furthermore, the augmentation of minimum wages does not effectively spur economic growth and, in times of economic downturns, may adversely affect vulnerable workers (Neumark & Wascher, 2010; Sabia, 2015).

E. Brynjolfsson and A. McAfee (2014) discussed the Great Decoupling between labor productivity, workers' earnings, and unemployment since the 1970s, attributing it to technological advancements. A. M. Stansbury and L. Summers (2018) analyzed the impact of productivity improvement on workers' wages, showing a positive association but indicating a decoupling trend. The significance of the decoupling phenomenon extends to the Western and Eastern European countries, with studies such as B. Trenovski, D. Gligorić, K. Kozheski and G. Merdzan (2023) highlighting the relationship between labor productivity and workers' compensation. Moreover, studies by V. Bucevska and K. Kozheski (2022) in Southeastern European countries emphasize the correlation between the rising GDP, labor productivity, and reduced youth unemployment. The high rate of NEET youth in the Western Balkan countries underscores the need to address youth disengagement from the labor market or education (Bojadjieva, Cvetanoska, Kozheski, Mujčinović & Gašparović, 2022). Overall, these studies shed light on the complex dynamics between labor productivity, wages, and economic growth, highlighting the need for further research and policy interventions so as to address the challenges posed by the decoupling phenomenon in various contexts.

DATA AND METHODOLOGY

This section outlines the methodology employed to assess the impact of the individual macroeconomic and institutional variables, namely the GNI *per capita*, the labor freedom index, the statutory minimum wage, and the unemployment rate on labor productivity. The analysis focuses on the selected countries from Southern and Eastern Europe, covering the period from 2013 to 2021. The countries under analysis, namely Albania, Serbia, North Macedonia, Bulgaria, Croatia, and Romania, are categorized into two distinct groups. The first group comprises the candidate countries for the EU membership and the participants in the "Open Balkan" initiative - Albania, Serbia, and North Macedonia. The second group encompasses the last EU entrants - Bulgaria, Romania, and Croatia. A segment of the empirical research delves into the developed countries of the EU (Artige & Nicolini, 2006), as well as the countries in both western and eastern Europe (Trenovski *et al*, 2023; Borović, Tomaš & Trivić, 2023). Additionally, there are empirical studies investigating labor productivity between the USA and Europe (Blanchard, 2004), with some works concentrating on the economic perspectives of the Balkan countries (Sergi, 2001). The examination of the economic perspectives and characteristics of the countries included in the "Open Balkan" initiative, particularly focusing on analyzing the gap with the EU and exploring possibilities for its reduction, constitutes the subject matter of the analysis in the empirical literature (Kulo & Novikau, 2023). The classification of countries into those participating in the "Open Balkan" initiative and the most recent EU entrants in Southeastern Europe will serve as a valuable addition to the previously conducted empirical analyses that center on the labor market performance, specifically emphasizing labor productivity. Table 2 provides the explanation of the variables used in the analysis.

Table 2 The description of the variables

Variable	Explanation	Source
Labor Productivity/ GDP per person employed (constant 2017 PPP $)	Labor productivity is a key measure of economic performance. Labor productivity is a fundamental metric that quantifies the efficiency and effectiveness of the utilization of labor in the production process. It is defined as the ratio of the total output generated to the input of labor employed in the production of goods or services. The utilization of labor productivity as an indicator can facilitate the development of effective labor market policies and enable the monitoring of their outcomes.	World Bank (2022)
GNI *per capita*, PPP (current international $)	Gross National Income (GNI) *per capita* is calculated as the aggregate value added by all resident producers, inclusive of any product taxes (excluding subsidies) not incorporated in the valuation of the output, in addition to the net receipts of primary income (encompassing compensation for employees and property income) from abroad. This total is then divided by the midyear population.	World Bank (2022)
Labor Freedom Index	Labor freedom encompasses the capacity for both workers and businesses to enter into employment contracts, to engage in their rights within the context of an employment relationship, and, for companies, the freedom to freely hire or terminate workers based on operational requirements. The concept of labor freedom involves the ability of individuals to secure and maintain employment in accordance with their preferences within a chosen work environment.	The Heritage Foundation (2022)
Statutory nominal gross monthly minimum wage (2017 PPP $)	Minimum wages refer to the lowest compensation that an employer is obligated to pay wage-earners for the services rendered within a specified time frame, and this remuneration cannot be diminished through either collective agreements or individual contracts.	European Commission (2023)
Unemployment, total (% of total labor force)	The unemployment rate is one of the basic indicators of the performance of the labor market in a national economy. Unemployment is the percentage of the people in the labor force who are unemployed. Therefore, identifying those in the labor force is necessary to determine the unemployment rate. A person who is employed or unemployed is considered to be a part of the labor force.	World Bank (2022)

Source: Authors

In order to determine the (non)stationarity of the panel or longitudinal data, the integrative characteristics of the used variables were tested using the LLC test. The null hypothesis of this test is that the variables that have a unit root are nonstationary. Based on the results of the LLC test conducted for the integrative characteristics of the variables in the model of this research study, it can also be said that, except for the minimum wage variable, all the variables are stationary in this model (Table 3). During that differentiation level, the statutory minimum wage is considered as nonstationary according to the additional test for integrative characteristics, but becomes stationary after the first differentiation.

A panel regression between labor productivity as the dependent variable, on the one hand, and changes in the statutory minimum wage, the labor freedom index, the GNI *per capita*, and the unemployment rate as the independent variables is conducted in the case of the two groups of countries (the "Open Balkan" countries and the last Southeastern EU entrants). This is done not only in order to analyze the determinants of labor productivity, their impact, but also to make a comparative analysis of the perspectives of the labor market in these two groups of countries. The econometric panel analysis was conducted using the Panel EGLS (period random effects) model. In order to analyze the justification for using the random effects model (random effects model), a Lagrange Multiplier test (LM test) was conducted. Along with the consideration of the number of cross-sections and independent variables, the results of the LM test indicate that the inclusion of cross-section fixed effects and period random effects is justified for parameter estimation. To account for the rise in the overall price level in the preceding period and focus on the genuine increase in labor productivity, all the variables under examination are presented in USD, adjusted for the purchasing power parity. Based on the review of the relevant empirical literature, the following hypotheses regarding macroeconomic and institutional determinants on labor productivity are posited:

H1: The GNI *per capita* has a significant impact on determining labor productivity.

H2: The labor freedom index is a significant determinant of labor productivity.

H3: The statutory minimum wage has a statistically significant influence on labor productivity.

H4: The unemployment rate represents a significant determinant of labor productivity.

For this purpose, two mutually independent panel analyses are conducted for the individual groups of countries. The estimated equations are given below:

$$\gamma_{it} = \mu + \beta_1 \cdot x_{it} + \beta_2 \cdot z_{it} + \beta_3 \cdot i_{it} + \beta_4 \cdot j_{it}\, \alpha i + \varepsilon$$
$$i = 1,2,\ldots,N;\ t=1,2,\ldots,T \qquad (1)$$

where μ represents the common constant term of all the units under examination and the random effect for each individual unit. It should be noted that, in this model, it is assumed that α_i are the independently and

Table 3 The results of the integrative characteristics of the used variables - the order of integration (LLC test)

Variable	Labor Freedom Index	Statutory minimum wage	Unemployment rate	GNI *per capita*
SEE EU countries (Group 1)	Level [-6.47923] (0.0000)	Level [-2.93399] (0.0017)	Level [-4.21102] (0.0000)	Level [-3.22295] (0.0006)
"Open Balkan" countries (Group 2)	Level [-6.24753] (0.0000)	1st difference [-3.15699] (0.0008)	Level [-5.73179] (0.0000)	Level [-1.46079] (0.0720)

Notes: The coefficients are presented in brackets, and p-values in the parentheses.

Source: Authors

identically distributed variables with the mean 0 and the variation δ_2, while β_1 is an independent parameter that is subjected to analysis. The β_1 parameter aims to show the increase in labor productivity per unit increase in the legal minimum wage, that is to say it provides an account of the marginal dependence between the individual variables. Pursuant to said, it should be stated that the logarithmic value for both variables is used in the model. Namely, the model measures the percentage change in labor productivity as a result of a 1% change in the level of the legal minimum wage. A straightforward approach for the examination of the panel data involves the estimation of pooled regression. The combination of cross-sectional fixed effects and period random effects in pooled regression allows for a flexible modeling approach. The fixed effects address the individual-specific differences, whereas the random effects capture the unobserved time-specific factors that are not constant across all the entities. The panel EGLS pooled regression with cross-sectional fixed effects and random period effects is a powerful method to control individual-specific characteristics and time-specific factors, providing the robust analysis of such panel data with potential heterogeneity across entities and over time.

DISCUSSION OF THE RESULTS

Based on the findings the regression analysis for the Southeastern countries that are the latest entrants to the EU, it can be inferred that labor productivity in this cohort is significantly influenced by gross national income *per capita*, the labor freedom Index, the minimum wage, and the unemployment rate. These variables collectively play a substantial role in shaping the productivity landscape in these countries. The results underscore the multifaceted nature of the factors contributing to labor productivity, ranging from the economic indicators such as the GNI *per capita* to the institutional aspects such as labor freedom and the minimum wage policies. The results reveal an inverse relationship between the statutory minimum wage and the labor freedom index, both of which exert discernible impacts on the dynamics of labor productivity. Given the fact that the statutory minimum wage is part of the components that influence the formation of the value of the labor freedom index, the inverse interdependence seems quite logical and justified. Hence, the increase in workers' freedoms analyzed through the prism of increasing workers' flexibility and reducing legal legislation, affects the decline of labor productivity. In this direction, the increase in the statutory minimum wage has a negative impact on the movement of labor productivity within the last EU entrants (Bulgaria, Romania, and Croatia). In the previous period, there was a significant increase in the statutory minimum wage, which was parallelly followed by an insignificant increase and stagnant labor productivity growth rates in these countries. The increase in the statutory minimum wage signifies a noteworthy increase in a company's expenses, especially within the sectors such as personal services, tourism, manufacturing, and retail trade, which collectively employ a substantial portion of the workforce in these countries. This, in turn, contributes to a further decline in labor productivity.

Among economic dynamics, there is a positive correlation between the increase in gross national income and the increase in labor productivity. Further increases in labor productivity are influenced by the growth of gross national income *per capita*. The analysis also encompasses the level of unemployment, with a focus on examining the changes it induces and its impact on alterations in labor productivity. Nevertheless, while there is an observable positive and statistically significant impact on labor productivity, its intensity is relatively weak. Consequently, it can be inferred that the rise in unemployment does not exert a substantial influence on the overall increase in labor productivity. Hence, there is a noteworthy prevalence of unproductive employment in these countries, particularly in the "Open Balkan" initiative countries. In this context, it is noteworthy to observe a trend in these countries where there was a simultaneous increase in employment and a decrease in labor productivity during the preceding period. Therefore, positing the thesis of an upswing in unproductive employment, characterized by a rise in employment coupled with a concomitant decline in labor productivity, appears to be justified.

Moreover, within the countries of the Open Balkan initiative (Albania, North Macedonia, and Serbia), the outcomes of the regression analysis (Table 4) substantiate the hypothesis regarding the statistically significant impact of gross national income *per capita*, the labor freedom index, the statutory minimum wage, and the level of unemployment on the determination of labor productivity. Certainly, even within this group of countries, a statistically significant and negative causal relationship is evident between the labor freedom index and the improvement of labor productivity. Specifically, the findings indicate a reduction in labor productivity by 0.003% with each one-point increase in the labor freedom index. Hence, although it is a matter of weak causality with low intensity, it should be emphasized that in the case of these countries, the increase in the flexibility of workers and the decrease in the rigidity of legal legislation have a negative impact on the determination of labor productivity. In this direction, because an above-average increase in the legal minimum wage was realized in these countries in the previous period, it is considered valuable to analyze its impact in determining labor productivity. Hence, the results show that the increase in the legal minimum wage positively impacts labor productivity in this group of countries (Albania, North Macedonia, and Serbia). An increase in the statutory minimum wage of 1% contributes to an increase in labor productivity of 0.24%. Furthermore, statistically significant, positive causality is also observed in the increase of the gross national income *per capita* and the level of unemployment. Table 5 summarizes the main empirical findings.

CONCLUSION

This research study examined the level of labor productivity among the countries of the "Open Balkan" initiative (Albania, Serbia, and North Macedonia) and Southeastern Europe's latest EU entrants (Bulgaria, Romania, and Croatia). Additionally, it explored the macroeconomic and institutional determinants influencing labor productivity, including the GNI *per capita*, the unemployment rate, the statutory minimum wage, and the labor freedom index.

The results indicate a discernible slowdown in the growth rates of labor productivity over the past decade in Southern and Eastern European countries. This deceleration, attributed to the factors such as the repercussions of the 2008-2009 recession, the 2013 debt crisis, and demographic changes, hampers progress towards achieving comparable levels of efficiency with the highly developed European nations. Despite the overall positive trend in labor productivity, the current pace of growth remains insufficient to close the gap with Western Europe. These countries continue

Table 4 The regression analysis results

	Dependent variable: Labor Productivity			
	Country Group 1: Bulgaria, Romania, Croatia		Country Group 2: Albania, North Macedonia, Serbia	
Variable	Coefficient	Prob.	Coefficient	Prob.
C	4.182782	0.0001	7.623215	0.0000
LOG(GNI *per capita*)	0.684502	0.0000	0.148736	0.4126
Labor Freedom	0.002623	0.0536	-0.004331	0.0323
LOG(Minimum Wage(1))	-0.058562	0.3504	0.240247	0.0302
Unemployment	0.014075	0.0000	0.015235	0.0002
R-squared	0.985430		0.988203	
Adjusted R-squared	0.981059		0.984039	
Number of Observations	24		27	

Source: Authors

Table 5 The summary of the main findings

Hypothesis	Hypothesis is supported	Implication
H1	The first hypothesis finds support in the case of Southeastern European (SEE) last EU entrants (Bulgaria, Romania, and Croatia), but it is not supported in the countries of the "Open Balkan" initiative (Albania, Serbia, and North Macedonia).	The level of economic development in Southeastern European (SEE) countries provides room for additional increases in labor productivity. A higher level of economic development signifies a robust foundation for intensive technological progress, the migration of workers to the industries generating greater added value, and substantial involvement in the tertiary industry, facilitating the establishment and maintenance of the elevated levels of labor productivity. In contrast, the countries of the "Open Balkan" initiative still allocate a notable share of production to traditional sectors, primarily the agricultural sector. Some industries in these countries lack sufficient technological intensification of production, limiting opportunities for more robust growth rates in labor productivity.
H2	The second hypothesis finds support in both groups of countries.	The labor freedom index is a relevant predictor of labor productivity in both groups of countries. However, on the example of the SEE last EU entrants, the labor freedom index has a statistically significant and positive impact on labor productivity. The labor freedom index comprises six equally weighted quantitative factors, each accounting for one-sixth of the overall labor freedom score. These factors, including the ratio of minimum wage to average value added per worker, hindrance to hiring additional workers, the rigidity of working hours, the difficulty of firing redundant employees, the legally mandated notice period, and the mandatory severance pay, are regarded as the positive determinants of labor productivity. A lower ratio of the minimum wage to value added, reduced hindrance to hiring, flexibility in working hours, the ease of workforce adjustments, shorter notice periods, and the lesser mandatory severance pay are associated with a more favorable environment for labor productivity. The equal weighting underscores their collective significance in evaluating and fostering labor market flexibility and efficiency, thereby contributing positively to overall labor productivity. In the context of the countries belonging to the "Open Balkan" initiative group, the observed relationship suggests that the labor freedom index exerts a negative influence on labor productivity. This implies that, as the labor freedom index increases indicating a higher degree of labor market regulation and potential constraints, there is a corresponding adverse impact on labor productivity. The negative influence may be attributed to the factors such as increased hindrance to hiring, the rigidity of working hours, challenges in workforce adjustments, longer notice periods, and higher mandatory severance pay, all of which contribute to a less flexible and adaptable labor market. This finding underscores the importance of considering the intricate dynamics between the labor market regulations and their implications for productivity in the specific context of the "Open Balkan" initiative countries.
H3	The third hypothesis finds support in the countries belonging to the "Open Balkan" initiative (Albania, Serbia, and North Macedonia).	The findings indicate that the statutory minimum wage has a noticeable impact on labor productivity in these countries. This observation carries significant implications, encompassing potential adjustments in the wage structure that may affect various segments of the workforce. Moreover, there could be notable changes in the cost of labor for businesses, influencing their operational dynamics. The implications extend to alterations in the overall economic landscape, reflecting the intricate interplay between statutory minimum wage policies and their consequences for both workers and the broader economy.
H4	The second hypothesis finds support in both groups of countries.	Variations in the unemployment rate exert a considerable influence on the overall efficiency and productivity of the labor market in these nations. The dynamism of the unemployment rate plays a pivotal role in shaping the workforce landscape, affecting not only the availability of the skilled and unskilled labor force but also influencing the overall utilization of human capital. High levels of unemployment may lead to the underutilization of available skills, hindering the productive capacity of the labor force. Conversely, lower unemployment rates often coincide with enhanced efficiency, as a more fully utilized workforce contributes to increased productivity and the economic output.

Source: Authors

to lag behind Western Europe in terms of efficiency, with a persistent disparity in both productivity and income levels. It is imperative for these countries to prioritize the initiatives that enhance productivity and efficiency, fostering a successful catch-up in productivity to align with international standards and ensure sustained economic development.

In the aftermath of substantial disruptions to working hours, primarily attributed to the COVID-19 pandemic, workers have experienced significant income declines in the recent period. Across the analyzed countries, labor income in 2020 witnessed an average decrease of 10% compared to the levels recorded in 2019. The pervasive impact of the pandemic on various sectors and industries has resulted in widespread economic challenges, leading to diminished earning potential for the workforce. Workers situated within the contingent receiving the statutory minimum wage, specifically those positioned in the first quartile of the wage distribution, have suffered a disproportionate impact from the repercussions of the COVID-19 pandemic. These individuals face the looming prospect of struggling to meet their basic needs. In the period preceding the crisis, there had been a discernible reduction in income inequality within the analyzed countries, particularly in the incomes of workers with lower earnings, influenced in part by policies such as increases in the statutory minimum wage. Regrettably, the onset of the COVID-19 pandemic has undermined these positive trends, contributing to a reversal in the trajectory of narrowing wage disparities and a simultaneous downturn in both the GDP and labor productivity.

In the preceding period, particularly in the years leading to the crisis, the statutory minimum wage in the countries under analysis has witnessed an above-average increase. This trend is notably pronounced in Bulgaria and Romania, where the statutory minimum wage has seen multiple increments. However, recent disruptions in economic flows, especially within the labor market, suggest that future adjustments to the statutory minimum wage should be approached with caution. The involvement of social partners and engaging in social dialogue, based on objective criteria and analyses, is crucial. Criteria for adjusting the minimum wage should account for workers' and their families' needs, as well as economic factors. While it is essential to ensure that low-paid workers can maintain their living standard by adjusting wages so as to compensate for rising inflation, implementing additional increases in the minimum wage may pose challenges for some countries. The risks associated with further increases in the statutory minimum wage are multifaceted. Setting the legal minimum wage at a high level, particularly when the relative ratio to average (median) wages is elevated, carries the objective risk of disrupting the labor market balance. This could lead to some workers either leaving their workplaces or experiencing reduced working hours. Moreover, in addition to the existing challenge of low labor productivity in these countries, the repercussions of the COVID-19 pandemic further contribute to a decline in labor productivity. This raises a significant question of whether and to what extent a further increase in the legal minimum wage will compel companies to optimize their work processes. Consequently, employment and labor productivity are contingent on adjustments to the level and scope of the legal minimum wage in the analyzed countries, potentially facing adverse effects from additional increases in some nations.

There are minor differences in the labor freedom index among the individual groups of countries, but there is a significant contrast between the two analyzed groups, notably with Albania and Croatia displaying distinctiveness. These countries exhibit a notable level of labor market regulation, akin to the recent EU entrants, influenced by the factors such as low trade union organization and worker qualifications. In contrast to the Western European economies with high labor productivity and low unemployment, further labor market liberalization is seen as beneficial for competition and growth. However, the findings of both groups of countries suggest that excessive flexibility, reduced barriers to market entry, and legal rigidities may negatively affect labor productivity. Therefore, considering labor productivity, the institutional capacity, and structural imbalances, some degree of regulation is deemed to be necessary and beneficial for companies and workers alike. Future labor market reforms should be

tailored to each country's economic and institutional capabilities. In Southeastern European countries, the labor market liberalization is essential for fostering new job opportunities and wealth creation amidst globalization and demographic changes. This underscores the need for change, emphasizing that improved social conditions and labor market flexibility may coexist harmoniously.

The analysis of the labor productivity determinants provides valuable insights into the factors influencing labor productivity in Southeastern European (SEE) countries, with a particular focus on the Southeastern European (SEE) last EU entrants (Bulgaria, Romania, and Croatia) and the "Open Balkan" initiative countries (Albania, Serbia, and North Macedonia). The findings support the first hypothesis, emphasizing the fact that the level of economic development in the SEE countries, especially among the SEE last EU entrants, allows for additional increases in labor productivity. The second hypothesis, supported in both groups, underscores the crucial role of the labor freedom index as a determinant of labor productivity, with implications varying between the two groups. The third hypothesis finds support in the "Open Balkan" initiative countries, indicating a discernible impact of the statutory minimum wage on labor productivity, with potential far-reaching consequences for wage structures and the overall economic landscape. Finally, the fourth hypothesis, supported in both groups, highlights the considerable influence of variations in the unemployment rate on the efficiency and productivity of the labor market, emphasizing the critical role of the workforce dynamics in shaping overall productivity.

The economic crisis primarily caused by the COVID-19 pandemic, supplemented by the military crisis in Ukraine, as well as the crisis that occurs as a lack and increase in the price of energy, has a direct impact on hindering the increase in labor productivity. Also, the expectations of business agents, that is to say the perceptions about the duration and extent of the crisis, are still being determined, which will further contribute to the slowdown of economic growth. Hence, considering the objective need to improve labor productivity, on the one hand, and workers' earnings, on the other, additional active policies on the labor market in these countries are necessary, especially those that will contribute to the establishment and retention of productive employment. Furthermore, it will affect the establishment of the balance in the labor market at a higher level.

The main limitation of this research study is due to a lack of data, which prevented the inclusion of the other relevant microeconomic determinants of labor productivity. Additionally, the constrained timeframe serves as yet another limitation, particularly so given the availability of the data on the statutory minimum wage over a relatively short period. The second limitation concerns the optimality of comparing results between the groups of countries, especially considering their intensive economic relations. Further research could focus on the analysis of additional microeconomic determinants, facilitating a comparison of labor productivity levels and the extent of economic development convergence across countries.

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